CLAIMS

We claim:

1. A control system for the steering of a skid steer vehicle having a loader arm capable of carrying a load, the control system comprising:

(i) a means for sensing the amount of load and generating a signal indicative thereof;

(ii) a means for sensing the height of the load and generating a signal indicative thereof;

(iii) a means for sensing the speed of the vehicle and generating a signal indicative thereof;

(iv) a means responsive to operator manipulation for generating an operator vehicle motion command; and

(v) an electronic controller coupled to the means of sections (i), (ii), (iii), and (iv), to generate a pump drive signal based at least upon the magnitude of signals received from the means of sections (i), (ii), (iii), and (iv).

2. The control system of claim 1, wherein the pump drive signal controls the displacement of at least one positive displacement hydraulic pump.

3. The control system of claim 2, wherein the pump drive signal controls the displacement of at least two positive displacement pumps.

4. The control system of claim 3, wherein the at least two positive displacement pumps include a first positive displacement pump that is fluidly coupled to at least a first hydraulic motor rotationally coupled to and disposed to drive at least one vehicle wheel on the left side of the vehicle and at least a second hydraulic motor rotationally coupled to and disposed to drive at least a second vehicle wheel disposed on the right side of the vehicle.

5. The control system of claim 4, wherein (1) the means for sensing the amount of load include a pressure sensor capable of measuring the pressure of a tire, the pressure of a loader cylinder, or the pressure of a suspension cylinder pressure, (2) the means for sensing the height of the loader arm include a loader cylinder position sensor or a loader arm position sensor, (3) the means for sensing the vehicle speed include a wheel speed sensor, a hydrostatic motor speed sensor, a GPS receiver, a ground sensing laser, or a ground-sensing radar, and (4) the means responsive to operator manipulation include a joystick or a left-hand drive lever and right-hand drive lever.

6. The vehicle of claim 1 wherein the load sensor includes a sensor disposed to detect the pressure in a loader arm lift cylinder.

7. A method of controlling the steering of a skid steer vehicle having a plurality of wheels mounted on the left vehicle side driven by at least a first hydraulic motor and a plurality of wheels on the right vehicle side driven by at least a second hydraulic motor, the vehicle further including at least a first hydraulic pump to drive the at least a first hydraulic motor and at least a second hydraulic pump to drive the at least a second hydraulic motor and an electronic controller coupled to the at least a first and at least a second hydraulic pumps to control their specific displacement, the method comprising the steps of:

(i) receiving a signal representative of a vehicle load;

(ii) receiving a signal representative of the height of at least a portion of the vehicle load;

(iii) receiving a signal representative of the speed of the vehicle;

(iv) receiving an operator-generated vehicle motion command; and

(v) combining the signals of steps (i), (ii), and (iii), with the command of step (iv) to generate a drive signal.

8. The method of claim 7, wherein the vehicle further includes a chassis, at least one loader lift arm and an implement, the arm having a first end coupled to

the chassis and a second end coupled to the implement, wherein at least a portion of the vehicle load includes a load carried by the implement, and further wherein the step of receiving a signal representative of a vehicle load includes the step of receiving a signal representative of the load carried by the implement.

9. The method of claim 8, further comprising the step of applying the drive signal to a positive displacement hydraulic pump to control the displacement thereof.

10. The method of claim 9, wherein the step of combining the signals includes the step of derating the vehicle's response to the operator-generated vehicle motion command.

11. The method of claim 10, wherein the step of derating the vehicle's response includes the step of derating the vehicle's turning rate.

12. The method of claim 10, wherein the step of derating the vehicle's response includes the step of derating the vehicle's rate of acceleration.

13. The method of claim 12, wherein the step of derating the vehicle's response includes the step of derating the vehicle's rate of deceleration.

14. The method of claim 13, wherein the step of receiving a signal representative of a vehicle load includes the step of receiving a signal from a loader lift arm cylinder pressure sensor.

15. The method of claim 14, wherein the step of receiving an operator-generated vehicle motion command includes the step of receiving a signal indicative of a commanded vehicle speed and commanded vehicle turning from an operator input device, and further wherein the operator input device includes a joystick.

16. The method of claim 15, wherein the step of receiving a signal representative of the speed of the vehicle includes the step of receiving a signal from one of the group consisting of a wheel speed sensor, a hydrostatic motor speed sensor, a GPS receiver, a ground sensing laser, and a ground-sensing radar.